THE RIDDLE OF LIFE

AN EXHIBITION OF ARTWORKS BASED ON A PARTICULAR DNA
MOLECULE AND A BRIEF EPISODE IN THE HISTORY OF SCIENCE

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IN COLLABORATION WITH

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16 October-10 November 1995

Ticknor Lounge / Boylston Hall and
an installation in Old Harvard Yard

(Entrance to Old Harvard Yard at Massachusetts Ave.)

Harvard University
Cambridge, Massachusetts

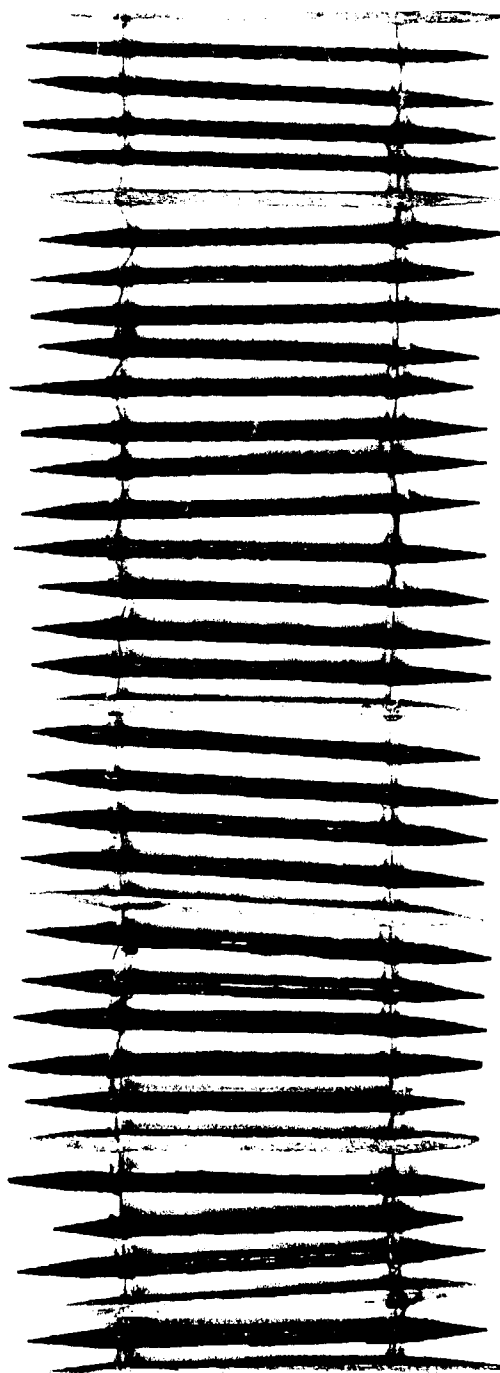### Reception Friday 27 October 5-7 PM

FEATURING AN ACOUSTIC PERFORMANCE BY
BAD ART ENSEMBLE

HOURS: Mon.-Thurs. 9AM - 9:30PM; Fri. 9AM - 5PM

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In the Fall of 1958, Max Delbrück, the great physicist turned biologist, sent a mysterious telegram to George W. Beadle at the Nobel prize ceremonies in Stockholm. Beadle received the prize for medicine and physiology in that year. Delbrück had composed his telegram in a form that reflected some of what were then very new and exiting ideas about the nature of DNA and the operation of the genetic code. It was also an important precedent for the idea that *extrabiological* information - in this case, English language - could be contained in genetic form. The telegram was sent as one continuous 'word' with 229 letters:

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ADB ACB BDB AD A CD C BB A BCB CD A CDB BC ABB AADCA CA
B DA BDB BB A AC A ACBBB A BDC CDB CCB BDB BB A ADB AD A
ADC CDC BBA DDC AC A ADB BDB DD ABB AC: A ACB CDB A BA
B DBBB A DD ABDBBB DA B DB ACB ADBB DBACB BDC BB ABD
CACA BB ACDA AC ADDBBDBBB ADDB AD AX BBADDBA
D AAC BC DC AC A BB A BCA BCBB DBAC B DDACD BDDCBDC
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The key to unraveling the message was that it mimicked the triplet operation of DNA. In Stockholm, George Beadle managed to crack Delbrück's code and read the English sentence:

BREAK-THIS-CODE-OR-GIVE-BACK-NOBEL-PRIZE-LEDERBERG-GO-HOME-
MAX-MARKO-STERLING.

The next day, Beadle replied with a slightly different triplet code of his own. Beadle sent his telegram to Delbrück's laboratory at Caltech in Pasadena, California. When Delbrück and his colleagues deciphered Beadle's code they found the return message:

GWBTOMDIMSUREITSAFINEMESSAGEIFICOULDDOTHEFINALSTEP

The historic 'biocommunications' between Stockholm and Pasadena were still not quite complete. Evidently, Delbrück and the group at Caltech weren't ready to let the recent Nobel laureate have the last word. They rallied with yet another mysterious message.

At a formal lecture after the Nobel prize ceremonies in Stockholm, Beadle was presented with a molecular model constructed from toothpicks (Delbrück had airmailed it to the presiding officer). Each central 'rung' of the ladder-like model was represented by a toothpick stained with one of four colors. Like the coded telegrams, the toothpick model contained an English language message, but with a code made up of colors rather than letters.

This time, Delbrück chose to encode a particularly poetic message. It embodied a theme that is important to the history of both the sciences and the arts, and a classical philosophical dilemma. The message sent to Beadle in toothpick form echoed the mythological *Riddle of the Sphinx* in which human beings unwittingly hold the solution to the most difficult problems (which of course, they have created for themselves).

Both Delbrück and Beadle had ingenious ideas for expressing human language in the form of DNA, but in 1958 no synthetic, or artificially constructed nucleic acids were available. A project to create the DNA corresponding to Max Delbrück's toothpick molecule was undertaken by Joe Davis, the Laboratory of Molecular Structure at MIT (Alexander Rich Laboratory), and the Burghardt Wittig Laboratory at the Institute for Molecular Biology and Biochemistry at the Free University of Berlin, Germany. The molecule that was first conceived nearly 40 years ago, actually came into existence in January, 1994. The current exhibition is based entirely on the forms and unique operations of this molecule, Max Delbrück's *RIDDLE OF LIFE*.

I never saw before

mentioned by H Grat — some reference to "Lederberg, go home!